

IN THE UNITED STATES DISTRICT COURT FOR THE
SOUTHERN DISTRICT OF NEW YORK

MIDWAY MANUFACTURING COMPANY:	:	Deposition of
vs.	:	William L. Harrison
THE MAGNAVOX COMPANY	:	Fourth Day
and	:	74 Civ. 1657 CBM
SANDERS ASSOCIATES, INC.	:	

74 Civ 1033

IN THE UNITED STATES DISTRICT COURT FOR THE
NORTHERN DISTRICT OF ILLINOIS, EASTERN DIVISION

THE MAGNAVOX COMPANY, et al :	Consolidated Actions	
vs.	:	74 C 1030 ✓
	:	74 C 2510 ✓
BALLY MANUFACTURING	:	75 C 3153
CORPORATION, et al	:	75 C 3933

Continued deposition taken
pursuant to subpoena and notice at the Sanders Associates,
Inc.; Headquarters, Spit Brook Road; Nashua, New Hampshire;
Wednesday, March 24, 1976; commencing at ten o'clock in
the forenoon.

FILED

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ERNEST W. NOLIN & ASSOCIATES

General Stenographic Reporters

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H. STONER, CLERK
UNITED STATES DISTRICT COURT

PRESENT:

For Midway Manufacturing Company, Bally Manufacturing Corporation and Empire:

Donald L. Welsh, Esq., 135 South LaSalle Street, Chicago, Illinois.

For Sanders Associates, Inc., and Magnavox Company:

James T. Williams, Esq., 77 West Washington Street, Chicago, Illinois.

For Sanders Associates:

Richard I. Seligman, Esq., Daniel Webster Highway South, Nashua, New Hampshire.

The Stenotype Reporter:

Ronald J. Hayward

WILLIAM L. HARRISON

called as a witness, having been previously sworn, was

A. Yes, sir.

further examined and continued his testimony as follows:

Q. And that is to be distinguished, is it not, from

(Interrogatories by Mr. Welsh.)

Q. Mr. Harrison, referring to page 71 of Exhibit 16, there appears to be a crowbar circuit and would you read the note to the lower right of that circuit?

A. "This configuration results in target disappearing

when hit is made." The question asked is whether

2 Q. Whose idea was it to provide such a crowbar circuit?

the question asked. MR. WILLIAMS: If you recall.

THE WITNESS: I do not recall, sir.

3 Q. Do you have any belief as to whose idea it was?

A. Yes, sir.

4 Q. What is that?

A. Mr. Baer's.

5 Q. Was the purpose of that circuitry to provide and achieved by providing the background with the disappearance of the monochrome dot?

A. I do not recall, sir; however, on page 71 of Exhibit 16, it indicates to me that it was.

6 Q. And you believe it was?

A. Yes, sir, I do.

7 Q. And that is to be distinguished, is it not, from prior disappearance where in response to the

Q. Yes, that is correct. prior disappearance where in response to the coincidence of two dots, one of which was of the red color and the background upon coincidence of the red color and the background upon coincidence changed to red, the red dot appeared to disappear?

MR. WILLIAMS: Well, I object to the question. Whether the witness feels the

two things should be distinguished is irrelevant.
It calls only for a matter of his opinion.

THE WITNESS: I need to hear
the question again.

(Whereupon, the previous
question was read back
by the reporter.)

THE WITNESS: I am not sure
I understand that question.

8 Q. Is it correct that disappearance of a dot previously
was achieved by changing the background color to
12 the color of the dot which disappeared?

A. Yes, sir.

9 Q. And that type of disappearance, it was merely
the impression that the image of the dot disappeared,
was it not?

A. Yes, that is correct.

10 Q. In other words, is it not true that there was still
the unblanking signal with respect to the beam
of the electron ray tube upon coincidence of the
signals from the horizontal and vertical delay
12 multivibrators in the circuitry for generating

that dot?

A. The circuitry was still active?

11 Q. Yes.

A. Yes.

12 Q. And is it not true that in that situation you
were able to see the dot when the background color
of the field was different from that of the dot?

A. I don't believe so, I would have to look at the
schematic again to be sure.

13 Q. Well, you stated that the circuit was still being
active generating the dot?

A. Generating the dot?

14 Q. Yes.

A. I thought I stated that the delay multivibrator
was still being active for generating the dot,
but the disappearance of the dot takes place in
the chroma circuits.

15 Q. Well, the disappearance previously; that is,
previous to this circuitry on Exhibit 71, was
due to change of the background color to the color
of the dot, was it not?

A. It appeared to disappear?

16 Q. That is correct. But the signals for generating

the dot was still present?

A. All right, I believe I was in error in my previous answer.

17 Q. And what answer was that?

A. That the dot is still present and that just the field is changed to appear the same color as the dot.

18 Q. Do you mean that something happens so that there was no unblanking of the beam to produce an image of that dot after coincidence?

A. Yes, sir, I believe so.

19 Q. Did you check the circuitry to determine that or the schematics, I believe you said you would have to do that?

A. Exhibit 23, page 81, indicates to me that the timer circuit, the crowbar timer circuit disables the chroma sync. gate which would yield a solid field of color on the TV screen and also disables the spot signal, the colored spot signal, from gating any color through.

20 Q. From gating any color what?

A. Through onto the screen. It disables that spot generator, as far as it being a color spot generator.

21 Q. Do I understand, then, that there is no signal
or no unblanking of the beam of the cathode ray
tube subsequent to that action with respect to that
spot signal generator?

MR. WILLIAMS: Well, I object
to the question, the witness gave no impression
as to what you understand, Mr. Welsh.

THE WITNESS: I am not sure
I understand the question, sir.

22 Q. You stated your study of the circuitry of Exhibit 23-81
indicates the crowbar timer circuit disables the
chroma sync. gate to yield a solid field of color
on the TV screen and also disables the color spot
signal and then there was some confusion. Would
you restate what happens with respect to the color
spot signal generator when the crowbar timer circuit
disables the chroma sync. gate to yield a solid
field of color?

A. The timer circuit disables the spot, color spot
signal, from entering the chroma sync. and video
gate. sir, there is.

23 Q. And what affect does that have with respect to
the spot generator? bottom right of center of the

A. With respect to the spot generator?

24 Q. With what affect does it have with respect to unblanking of the beam?

A. It disables the unblanking of the beam.

25 Q. So there is no longer any unblanking which would have resulted in an image being generated on the screen?

A. As far as that spot generator is concerned, yes, sir.

26 Q. And the result is that the spot does disappear, does it not?

A. Yes, sir.

27 Q. Now, you have just been stating that the crowbar timer circuit disabled the chroma sync. gate and also disables the color spot generator signal from entering the chroma sync. and the video gate, so there is a disappearance of the spot, is there any provision in that circuit of Exhibit 20-81 for obtaining this same action when there is a coincidence of two spots?

A. Yes, sir, there is.

28 Q. And where do you find that provision?

A. Exhibit 23-81, the bottom right of center of the

page, a circuit called the coincidence gate.

29 Q. Referring now to page 45 of Exhibit 16 which bears the date of May 24, 1967, as compared to the date of June 14, 1967, of Exhibit 23-81, there is a statement - - - - - Exhibit 16; that

A. 23-81? 24, 1967, or was the date of Exhibit 16 45

30 Q. Yes, that is the one you just had out. The date of that is June 14, 1967, and the date of Exhibit 16-45 is May 24 or earlier; now, on page 45 of Exhibit 16 is the statement, "Via a coincidence gate, timing circuit SCR is turned on and the red character disappears as the color field changed from green to solid red except for the blue character which remains." Now, the disappearance or the apparent disappearance of the red character there was due to change of the background color to the same color as the character, was it not?

A. No, sir.

31 Q. Was there also, then, provided at that time, May 24, 1967, a disabling of the color spot signal for entering the chroma sync. and video gate upon

A. coincidence of the two spots?

A. I am sorry, I am in error. The color spot is the

same color as the background color and would change to it when the crowbar circuit does indeed cause that spot to disappear.

32 Q. Well, was there a crowbar circuit at the time when this entry was made on page 45 of Exhibit 16; that is, May 24, 1967, or was the crowbar circuit added after that time and before its appearance on Exhibit 23-81, which is dated June 14?

A. As I recall, the SCR timing circuit was there. The crowbar circuit was there.

33 Q. The SCR timing circuit, then, was a crowbar circuit?

A. Yes, sir.

34 Q. Is it true, then, that as of the May 24, '67, entry on page 45 of Exhibit 16, upon coincidence of the two spots, the crowbar timer circuit operated or the result of the operation of the crowbar timer circuit, was not only to change the background color of the field, but also resulted in the spot signal of the color spot from entering the chroma sync. and video gate?

37 A. Prior to 5-24?

35 Q. No, as of that time.

A. May I have the question again?

(Whereupon, the previous question was read back by the reporter.)

THE WITNESS: Yes, sir, I believe that to be true.

36 Q. Then it was not merely the change of background color to the color of the red character that caused the red character to appear to disappear? And I am still referring to page 45 of Exhibit 16.

MR. WILLIAMS: You are referring to the date on that page?

MR. WELSH: Yes, still as of that date.

THE WITNESS: I am not sure how to answer that question because the crowbar circuit disables both the chroma sync. video gate and simultaneously disables the signal coming from the chroma spot generator.

37 Q. And when you made that statement, you were referring to the crowbar circuit of Exhibit 23-81, is that correct?

A. Yes.

38

Q. Now, was the same crowbar circuit and coincidence gate involved or in existence as of the time this entry was made on page 45?

A. As I recall, it was.

39

Q. So it is the same circuit referred to on page 45 that is shown on 23-81?

A. I believe so, sir.

40

Q. In that case, then, the operation described on page 45 is the same as the operation of Exhibit 23-81, is it not?

A. I believe so, sir.

41

Q. Whose idea was that to disable the signal of the colored spot from entering the chroma sync. and video gate at the same time that the chroma sync. gate was disabled as to yield a solid field of color on the TV screen?

A. I do not recall, sir.

42

Q. Do you have any belief?

A. Yes, sir.

43

Q. What is that?

44

A. I believe that I would have done it, because that

Q. Do you also believe that you did it?

A. Yes, sir. At that point where that crowbar circuit is to disable the chroma sync. gate, I believe that happened rather automatically because of a simple way to get a colored spot.

45 Q. Is it correct, then, that disabling of the color spot signal was automatic with disabling of the chroma sync. gate because of the way in which you obtained the colored spot signal?

A. Yes, sir.

46 Q. And whose idea was that circuitry for obtaining the color spot signal?

A. I do not recall, sir.

47 Q. Do you have any belief?

A. No, sir, I don't.

48 Q. You devised the circuitry or thought it up, did you not?

Q. I don't understand you. MR. WILLIAMS: I object to the question as vague. What do you mean by devised or thought it up; it is also in the alternative.

is the purpose of the MR. WELSH: Strike the question,

A. I will restate the question.

49 Q. Did you design that circuitry for generating that

A. colored spot?

A. Yes, sir. As I recall, I did.

MR. WELSH: Why don't we take
a break at this time.

(Whereupon, a recess
was taken.)

50 Q. (By Mr. Welsh) Now, referring again to the
configuration on page 71 of Exhibit 16 which is the
crowbar circuit for causing the target to disappear
when a hit is made, that crowbar circuit is different
from the one that we have been discussing on page 16-45
and 23-18, is it not?

A. The crowbar circuit is different?

51 Q. Yes. I mean, it is a different circuit in connection
with the other parts of the schematic to produce
a different result?

A. I don't understand your question. As it relates

52 Q. Well, is it a different crowbar circuit?

A. The crowbar circuit I believe is the same.

53 Q. Is the purpose of the crowbar circuit different?

A. Yes, sir. Some kind of gun-simulating device.

54 Q. And what is that different purpose?

A. To make a target disappear, well, then the

55 Q. The target being a spot?

A. Yes, sir.

56 Q. And that is regardless of whether it is a colored spot on a monochrome spot, is that correct?

A. No, sir.

57 Q. Is it only for a monochrome spot?

A. Yes, sir, as I recall.

58 Q. Now, that circuitry on page 16-71 was designed to result in a target disappearing when a hit was made as distinguished from disappearing when it was coincident with another spot, is that correct?

A. Would you read the question back, please?

(Whereupon, the previous question was read back by the reporter.)

THE WITNESS: As it pertains to page 71, that is true.

59 Q. Is it not also true that what was sought there involved a single spot and the use of a photoelectric cell and some kind of gun-simulating device so that when the light of the spot was received sufficiently by the cell to create a signal, then the spot

would disappear?

A. As I recall, that is true, sir.

60

Q. When we adjourned last week, I believe you were referring to pages 57 and 59 of Exhibit 23 and with respect to Exhibit 23-57, you indicated that you had been making resistance measurements on photocells, that was in connection with this target-shooting game, was it not?

A. As I recall, it was.

61

Q. What did you do next in your work on the TV game project? I might note also that you had previously discussed page 76 of Exhibit 16 and the attached circuit diagrams.

A. I do not recall, sir; however, Exhibit 16, page 77 and 78 indicate to me that the target-shooting circuitry was only marginal at that time and I proceeded to attempt to improve its sensitivity.

62

Q. 16-77 and 16-78, did you say?

A. Yes, sir.

63

Q. The bottom of page 78 contains an entry entitled "Coincidence Gate," did that entry also relate to your attempting to improve the sensitivity with respect to the target-shooting circuitry?

A. May I have the question again, please?

(Whereupon, the previous question was read back by the reporter.)

THE WITNESS: I do not recall, sir.

Q. What did that entry with respect to the coincidence gate involve?

A. It involved away, a means for having the contrast of one of the spots variable; namely, the target spot.

Q. That was for the target-shooting game?

A. I believe it would have to have been, sir.

Q. Was that an effort to make that spot brighter so that it would be easier to detect a hit in that game?

A. At this time I believe that would be true.

Q. What did you do next on the work on the TV game project?

A. I do not recall, sir, however, Exhibit 16, page 79,

C. the top half of the page indicates to me that I

A. took the TV game to my residence again to see how

it operated into my Heath TV.

68 Q. Does the entry there indicate how it operated?

A. Yes, sir, it does.

69 Q. How did it operate?

A. I had trouble or apparent trouble - apparent to me, trouble with the RF level and trouble when I thought that the TV set was properly tuned and having satisfactory sync. and also found that adjusting the threshold of the target-shooting game, it was more difficult than it had been in the lab with daylight.

70 Q. What did you do next on the TV game project?

A. I do not recall, sir; however, Exhibit 16, page 79, the bottom half, and page 80, three-quarters of that page indicates to me that I did further experimentation trying to improve sensitivity of the target-shooting game.

71 Q. What did you do next on the TV game project?

A. I do not recall, sir; however, Exhibit 16, page 80 at the bottom of the page indicates to me that

A. I made some power drain measurements.

72 Q. With respect to what did you make such measurements?

73 A. I believe it would be the basic circuit necessary

to produce two monochrome spots on the screen.

73 Q. Was that in connection with the target-shooting game?

A. I do not recall, sir.

74 Q. Do you have any belief?

A. Not at this time, sir.

75 Q. The other work that you were doing at that time, however, was with respect to the target-shooting game, is that correct?

A. That is how it is indicated in this notebook, yes.

76 Q. And you believe that is to be true?

Q. Yes, sir.

77 Q. What did you do next in the TV game project?

A. I do not recall, sir; however, Exhibit 16, page 81, indicates to me that I began to construct an engineering model box which would house circuits pertaining to the TV game. That is noted at the top half of the page.

78 Q. And did you construct such a box?

A. As I recall, I did at least partially construct such a box. I do not recall if it was completed.

79 Q. What games were intended to be played with the

circuitry of that box?

A. I do not recall, sir, other than I believe at least the target-shooting game was involved in this box.

80 Q. What was the partial construction that you recall having done on that box?

A. What was the partial construction?

81 Q. Yes, you said you recalled at least partially constructing the box, I wonder what part you did construct, and how far you went?

A. I do not recall if I finished it or not; I may have finished it here.

82 Q. Yes, but do your notes indicate here what you did toward finishing it?

A. I do not find anything in my notes at this time that indicates the level of construction that

A. I attained.

83 Q. Does Exhibit 18-82A relate to that box?

MR. WILLIAMS: 18-82A?

MR. WELSH: I am sorry, it should be 16-82A.

90 A. THE WITNESS: I believe it does, sir.

84 Q. And what is Exhibit 16-82A?

A. What?

85 Q. What is Exhibit 16-82A?

A. It is a schematic of circuitry necessary to produce two monochrome spots on a TV screen with a crowbar circuit to cause one of the spots to disappear.

86 Q. Is there any circuitry for detecting coincidence of the two spots?

A. Not visible to me, sir.

87 Q. Now, on Exhibit 16-82A is attached to page 82 of Exhibit 16, are there any entries on that page that relate to the model box which you referred to on the top of page 81?

A. Yes, sir, there is.

88 Q. What is that?

A. Some battery life test data.

89 Q. Is there any indication as to whether you constructed the circuitry on Exhibit 16-82A?

A. Yes, sir, I believe there is.

90 Q. What is that?

91 A. That I took data that was referenced to this schematic, henceforth I would have had to have had

the circuitry in order to have done that.

91 Q. Do you then believe that you at least constructed
the circuitry on Exhibit 16-82A?

A. Yes, sir.

92 Q. Does the entry at the bottom of page 81 relate
to that same box?

A. Yes, sir, I believe it does.

93 Q. Is that oscillator a part of the circuitry on
16-82A? That is the oscillator at the bottom of
page 81.

A. Yes, sir, it is.

94 Q. I believe you stated that you thought at least the
target game was one intended to be played using
that engineering model box; what was your basis for
that belief?

A. That the crowbar and the photocell and push button
used for a trigger switch is also shown in that
schematic.

95 Q. That is shown in the lower right-hand corner of
that schematic?

A. Yes, sir.

96 Q. What did you do next in your TV game project work?

97 A. I do not recall, sir; however, Exhibit 16, page 83

and 84 and 85 indicate to me that I did more work on the target-shooting game and actually constructed some of the circuitry into a toy rifle. Also Exhibit 23-65 and 66 indicate some of the work, I guess.

97 Q. As of the time this work was being done; was the purpose to - - - Was the target-shooting game in a process of development?

MR. WILLIAMS: As of what time are you referring to?

MR. WELSH: As of that time.

98 Q. There has been considerable work on the target-shooting game indicated in your notes here, does the fact that you continued to work on it indicate that you have not yet arrived at a design which was felt to have been finished or completed?

A. Yes.

MR. WILLIAMS: Well, I object, was felt by whom; the question is vague and indefinite.

MR. WELSH: I believe he answered the question.

99 Q. What difficulties, if any, were you experiencing

at this time with respect to the target-shooting game?

- A. As I recall, the problem was that as the light environment in the room changed or the distance of the rifle from the screen changed, that the sensitivity level adjustment was critical.

MR. WELSH: Could I have that answer back, please?

(Whereupon, the previous answer was read back by the reporter.)

- 100 Q. Would you be a little more specific as to how it was critical or what happened as the light environment changed or the distance of the rifle from the screen changed?

- A. As I recall, if the sensitivity threshold was adjusted with one ambient light level in the room and if the room somehow was made darker or lighter, it would upset the sensitivity of the target-shooting game.

- 101 Q. And what happened as a result?

- A. As I recall, you may score a hit while not having

had it pointed at the target or perhaps you wouldn't have scored a hit when it was pointed at the target.

102 Q. Was it erratic response of the game, is that an accurate characterization?

MR. WILLIAMS: I think you should define what you mean by erratic in your question, Mr. Welsh, otherwise I object to it as vague and indefinite.

MR. WELSH: I think he understands the question.

MR. WILLIAMS: I still object to the question. Just because he understands the question, doesn't mean that the question will be understood by whoever reads this record.

THE WITNESS: I am not sure what is meant by erratic.

103 Q. Could you characterize the operation of the game as unreliable?

A. Yes, sir, at that time.

104 Q. Did it later become reliable?

105 A. As I recall it did, sir.

Q. When did it become reliable?

A. I do not recall, sir. The problem reflected an error.

Q. Did it become reliable because the problem was solved?

A. As I recall it did, sir.

Q. Who solved the problem?

MR. WILLIAMS: If you recall, please state the name.

Mr. Harrison.

THE WITNESS: As I recall, I did indirectly.

Q. How do you mean indirectly?

A. I talked with a man that was familiar with lenses and light optics.

Q. Did you solve the problem from information gained from him?

A. As I recall, I did, sir.

Q. Who was that man?

A. Hector Desrocher.

Q. How do you spell Desrocher?

A. I do not recall the spelling.

Q. Was he an employee of Sanders?

A. Yes, as I said.

Q. The game department where you were working?

A. I do not recall, sir.

114

Q. Is that solution of the problem reflected in your notes? We might break for lunch and we can resume and you can answer that question when we get back.

(Whereupon, the luncheon recess was taken.)

115

Q. (By Mr. Welsh) Mr. Harrison, just before the noon break you were discussing the problem of a change of the ambient light or the distance of the rifle from the screen which would result in upsetting the sensitivity of the target-shooting game and that you had solved that problem after talking with Mr. Hector Desrocher. The question that was pending when we broke was, Is your solution to that problem indicated in your notes? Might I direct your attention to the entry on page 85 of Exhibit 16.

A. Yes, sir.

116

Q. The question was, Is the solution indicated in your notes and I said - --

117

A. I am sorry, I just mean I have got page 85.

117

Q. Does that indicate that the problem was solved as

of the time of the entry of the note?

A. Not to me, it was just an opinion that to me now that it was fair or what I thought to be fair at that time. Fairly good.

118 Q. What was the solution to the problem which you did indirectly with information gained from Mr. Desrocher?

A. Exhibit 25, page 26, indicates that I added a bias lamp or bias light source at the photocell.

119 Q. Is that the solution to the problem? Was that the solution to the problem which you did indirectly?

A. Yes, sir. That is the solution I have been referring to.

120 Q. And that took place on December 10, 1968?

A. I do not recall.

121 Q. Do you believe that?

A. I would say on or about that time, yes, sir.

122 Q. Going on - excuse me, go ahead. Did you find other entries relating to the solution to that problem?

A. Exhibit 25, page 21, indicates that I started or was involved in some experiments with a light bias on or about 11-5-68.

123 Q. Up until that time in November and December of 1968, had you continued to have the problem that

you spoke about with respect to the sensitivity of the target game being upset with changes in the ambient light or distance of the rifle from the TV screen?

A. I would believe that could be a true statement.

124 Q. What did you do next on the TV game project after your work on page 83, 84 and 85 of Exhibit 16?

A. I do not recall, sir; however, Exhibit 16, page 86, indicates to me that I proceeded to build a chroma plug-in card that would be utilized with what was referred to earlier as engineering Model No. 1, page 82 of that exhibit.

125 Q. What is the date of that entry on page 86 of Exhibit 16?

A. I believe it is 8-14-67, sir.

126 Q. Is that also the subject matter of Exhibit 16-67?

A. Yes, sir, I believe it is.

127 Q. Did you actually build that card?

A. Yes, sir, I believe I did.

128 Q. What happened next in your work on the TV game project?

A. I do not recall, sir; however, Exhibit 16, page 87, indicates to me that I was having some sort of

tearing or distortion of the displayed - one of the displayed spots - and I proceeded to build a one-transistor operational amplifier to sum all the spot signals and to yield better isolation between them.

129 Q. Did that eliminate the problem?

A. Exhibit 16, page 87, near the bottom indicates that I eliminated the problem.

130 Q. Could you go on as to what you did next?

A. I do not recall, sir; however, Exhibit 16, page 88, indicates to me that I added the chroma circuit board to this model, engineering model, and got some results that wasn't identical to the previous results.

131 Q. And what occurred next?

A. I do not recall, sir; however, Exhibit 16, page 89, indicates to me at this time it was desired to add another coincident circuit to this engineering unit to make one dot disappear on a black-and-white set when playing the fox and hound hunt game.

132 Q. Was that the first time that the thought occurred

A. of producing disappearance of one of two dots upon coincidence of the dots in a black-and-white set?

A. I believe that to be true, sir.

133 Q. Previously we had on page 45 of Exhibit 16 on
page 81 of Exhibit 23 discussed disappearance of - -

A. Which page was that on in Exhibit 16?

134 Q. 45, and page 81 of Exhibit 23, we dealt with
disappearance of one dot upon coincidence of two
dots when the one dot was in color, is that
correct?


A. Yes, sir.

135 Q. Is the circuitry referred to on page 89 of Exhibit 16
different from the circuitry of page 45 of Exhibit 16
and page 83 of Exhibit 23 for achieving the purpose
of disappearance of a dot upon the coincidence of
two dots?

A. Yes, sir, I believe it is.

136 Q. How does the circuit for achieving disappearance
of one of two dots on the black-and-white set
upon coincidence as on page 89 of Exhibit 16 differ
as compared to the disappearance of one of the
two coinciding dots on page 45 of Exhibit 16 and
Exhibit 23-81?

A. Exhibit 16, page 89, is a logic type circuit which
needs the anding of two signals to back bias two



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Pg. 32 - Line 2 - I believe I must have said "gate of the SCR."
Or "gate of the SCR crow bar."

5/5/76 W.L.H.

diodes such that a signal can be sent to the control bar gate, the SCR gate. In Exhibit 23-81, I believe I have adjusted the summation of currents into the base of a transistor to obtain the same results or similar results.

137 Q. Were you the one who considered it desirable to add the other coincidence circuit referred to on page 89?

A. Exhibit 16, page 89?

138 Q. Excuse me, Exhibit 16, page 89.

A. There is a note saying updated schematic attached to this page.

139 Q. There is no schematic attached to that page in Exhibit 16, is there?

A. Not at this time.

140 Q. Are there any staple holes?

A. Yes, sir, there appears to be.

141 Q. Does the circuitry on page 70 of Exhibit 23 have anything to do with that coincidence circuit referred to on page 89 of Exhibit 16?

A. I believe it does, sir.

142 Q. In hand you now some other circuits or diagrams which were marked previously as Exhibits 9-89 and

9-91 which bear the same date of September 12, 1967, as page 89 of Exhibit 16 and ask if Exhibits 9-89 and 9-91 show the coincidence circuitry referred to on page 89 of Exhibit 16?

A. It does, sir, except for a resistor missing on the diagram in Exhibit 16 on page 89.

143 Q. Is there any relation between Exhibits 9-89 and 9-91?

A. 9-91 is a marked up copy of 9-89. I am sorry, 9-89 is also a copy. May I say that 9-91 is a marked up copy of the master dated 9-12-67.

144 Q. Did you prepare the master?

A. Yes. I recall, it is the electronics that were made

145 Q. From which these were made?

146 A. Yes, sir, I believe I did. date? MR. WILLIAMS: By these, you

are referring to 9-89 and 9-91?

Q. Are the dot generators shown in Exhibit 9-89 generally

146 Q. of the same type as the dot generator shown in Exhibit 9-89?

A. I believe it would represent the engineering model 1 box referred to. MR. WILLIAMS: I object to that

147 Q. And that is the one you are not sure whether you completed?

A. That is the one that I was not sure that I had completed, yes, sir.

148 Q. Are you still not sure?

A. I feel more sure now, sir.

149 Q. Could you go on with what you did next in the TV game project?

A. I do not recall, sir; however, Exhibit 16, page 90, has a rifle electronics diagram attached to that page which I drew.

150 Q. And is there a date on that diagram?

A. 9-12-67, sir.

151 Q. And what does that circuit diagram represent?

A. As I recall, it is the electronics that would have been in the toy gun.

152 Q. Is that shown on Exhibit 9-89 which bears the same date?

A. No, sir, it is not.

153 Q. Are the dot generators shown on Exhibit 9-89 generally of the same type as the dot generator shown on the circuit diagram or schematic of Exhibit 23-81?

MR. WILLIAMS: I object to the question; I don't understand what you mean by generally the same type.

154 Q. Well, are they of the same type?

MR. WILLIAMS: I don't think that corrects the objection. The question is still objectionable as vague. It also calls for pure speculation on the part of the witness.

155 Q. I am sorry, that is my copy. I think the original of 23-81 is a larger diagram.

A. May I have the question again, please?

(Whereupon, the previous question was read back by the reporter.)

THE WITNESS: I don't know what you mean by the same type.

156 Q. I will rephrase the question. There are two dot generators shown in each of these schematics, 23-81 and 9-89, are there not?

A. Yes, sir.

157 Q. Is the circuitry for each of the dot generators on Exhibit 9-78 similar to or different from the circuitry for each of the dot generators on Exhibit 23-81?

158 MR. WILLIAMS: I will object

to the question as being vague. I don't know what you mean when you say are the two circuits similar to two different ones.

A. I don't understand the question, I guess, sir.

158 Q. Would you describe how the dots are generated with the dot generator, each or either of the dot generators of Exhibit 23-81?

A. Exhibit 23-81, the dot generator has a two-transistor delay multivibrator as synchronized by the horizontal sync. generator. Its output drives an additional one-transistor stage that is also connected in a configuration to be a timing type of signal generator. A timed signal generator is referred to as a monochrome square or part of a monochrome square ^{pulse} ~~plus~~ shaper and gate. There are two such delays multivibrators, one for the horizontal portion and one for the vertical portion of the spot generator signal. And also there are two pulse shaper and gates that have their collectors tied common to one collector load. At this point, the signal is derived to generate a spot on the CRT.

5/9/76
WLN.

159 Q. Would you now describe how a strike that. Does each

of the spot or dot generators of Exhibit 9-89 operate in the same way? That is, each in the same way as the other? I am sorry, that question might be misleading; does each of the dot generators of Exhibit 9-89 operate in the same way as the other one to produce a dot?

A. As the other one?

160 Q. Yes, that is, are the two dot generators of Exhibit 9-89 similar to each other?

A. To generate the dot?

161 Q. A dot.

A. Yes, sir.

162 Q. Would you describe how one of those operates?

A. The dot generator in Exhibit 9-89 has positioning delay timers in both the X and the Y axis, one transistor device delay timer and ^{the} ~~a~~ spot, width and height time periods are RC type of time elements that are anded via diodes into the base of an output transistor.

163 Q. Would you now go on as to what you did next in the TV game program?

A. I don't recall, sir; however, Exhibit 16, page 91, indicates that I perform an experiment which

consisted of crowbarring the antenna terminals during a live program. That is the TV antenna terminals. Also I experimented with trying to pick up horizontal sync. from a TV set through inductive coupling.

164 Q. What was the purpose of your first experiment for crowbarring the antenna terminals during a live TV program?

A. At that time?

165 Q. Yes.

A. I do not recall.

166 Q. What was the purpose of the other experiment of trying to pick up the horizontal sync. from the TV set?

A. I believe it was in an attempt to find a way to cheaply obtain a sync. generator.

167 Q. What was the next work you did on the TV game project?

A. I do not recall, sir; however, Exhibit 23-92 and 95

168 Q. Did you say to or and? Exhibit 23-92 and 95

A. 23-92 and 23-95 indicate that an attempt was made to utilize integrated circuits at least on paper.

169 Q. Why was that attempt made? documents at this time

A. It was done to see if the unit could be made cheaper by utilizing integrated circuits.

170 Q. And did you determine that? That is, whether it could be made cheaper?

A. Exhibit 23-95 indicates that it was not cheaper and consumed more power.

171 Q. Now, referring back to Exhibit 16, between the August 3 date of the entry on page 84 and the October 5 entry on page 91, there are only a few pages with entries, yet a period of approximately two months passed there, was that a period of reduced activity with respect to your work on the TV game project?

MR. WILLIAMS: If you recall, Mr. Harrison.

THE WITNESS: I do not recall.

172 Q. Do you have any belief in that regard? In your answer you may wish to refer to Exhibit 23 because I believe there are some pages of that exhibit with dates which fall between August and October 5 which don't have corresponding entries in Exhibit 16?

MR. WILLIAMS: Are you asking for the witness to review the documents at this time

and form a present belief based on that review?

MR. WELSH: No, but whether he has any belief based upon refreshing his recollection from reviewing the entries which he made during that period.

THE WITNESS: May I have the question again, please?

(Whereupon, the previous question was read back by the reporter.)

MR. WILLIAMS: The question is also vague, it says reduced activity and that refers to activity in some other period which hasn't been defined.

THE WITNESS: I just do not know; however, I may have been involved in building hardware, for example, obtaining a toy rifle of a different sort ^{or} building hardware per se during the time also which may have utilized a good part of my time.

Q. Do you recall around that time any lessening of activity with respect to the TV game project due to

allotted funds running out?

A. I do not recall, sir.

174 Q. Did you have anything to do with the funding of the
TV game project?

A. Did I have anything to do with the funding?

175 Q. Yes, is that so?

A. No, sir.

176 Q. The last entry in Exhibit 16 as we have just
indicated was October 5, 1967, you had another
bound notebook which has been marked as Exhibit 25,
the date of the first entry in Exhibit 25 is
December 27, 1967, which is more than 2 1/2 months
after the last entry in Exhibit 16. I do notice
that there are pages of Exhibit 23 which bear dates
during that period of October 5 to December 27,
1967; is there any reason why you did not maintain
a bound notebook during that period or if you had
the notebook, why you did not make entries in it?

A. May I have the question again, please?

in some way?

(Whereupon, the previous

question was read back

you said that?

by the reporter.)

to the effect that

THE WITNESS: I do not recall why I did not make these entries in the notebook; however, Exhibit 23-106 indicates to me that that would have been approximately the time that Bill Rusch came on board the program.

177 Q. What is there about Exhibit 23-106 that indicates
180 that to you?

A. The words "diode slicer."

178 Q. Had that term not arisen in connection with the
181 TV game project before Mr. Rusch came on board?

A. Not that I recall.

179 Q. Did his coming on board have something to do with
182 your not making entries in a bound notebook of work
being done including that which appears on

A. Exhibit 23?

MR. WILLIAMS: Exhibit 23 what?

MR. WELSH: Well, the pages of those exhibits that bear dates that do not have entries or dates on which there are no entries in bound notebooks.

183 MR. WILLIAMS: I am sorry, you said on 23 and I thought you were referring to a specific page. It was no

MR. WELSH: I meant in.

THE WITNESS: As I recall,

I proceeded to work to aid Mr. Rusch and whereupon he had a notebook, I somehow believed that my work sheets here were just backup material that perhaps I would have handed to him if he had wanted them.

180 Q. What is the date of Exhibit 23-106 which indicated to you that Mr. Rusch had come on board the program?

A. 10-23-67.

181 Q. Did you do any work on the TV game project between October 10, 1967, and that date of October 23?

A. Yes, sir, I did.

182 Q. And what was the work done by yourself or in aiding Mr. Rusch?

A. Could I have the question again, please?

(Whereupon, the previous question was read back by the reporter.)

THE WITNESS: I believe it was done by myself and in conjunction with Mr. Baer.

183 Q. Does any reason occur to you now as to why that work or any part of it was not noted in any bound book?

184 A. No, sir, it does not.

Q. What did that work consist of?

A. Exhibit 23-93 and 23-94 indicate to me that I was trying to figure out just how many functions I could obtain with that TV game as it was at that time.

185 Q. Is that the TV game that is represented in the schematic circuit diagram, Exhibit 9-89?

A. I believe it would be.

186 Q. And what else did you do in that period when you were working with Mr. Baer before Mr. Rusch came on board on the TV game project on October 23, 1967?

MR. WILLIAMS: Well, I object to the question. The witness did not testify that Mr. Rusch came on the project on October 23, 1967. I believe he said he had come on by that time.

187 Q. Well, could you go on with the work that you did with Mr. Baer prior to the time that you started to aid Mr. Rusch commencing on October 23, 1967?

A. Exhibit 23-96 indicates that I tried to economize by removing components from the modulator circuit and to reduce even more components by integrating the summer amp and the RF oscillator. Exhibit 23-97

is not clear to me as to what I was trying to do.
Exhibit 23-98, as I recall, was an attempt to
produce very simply vertical lines, a number of
vertical lines across the face of the screen.

MR. WELSH: I see we have
reached five o'clock so why don't we break here
and resume at this point tomorrow.

(Whereupon, the deposition in the above-entitled
matter was continued at 5:05 p.m.)

William L. Hansen
Deponent

THE STATE OF NEW HAMPSHIRE)
COUNTY OF Hillsborough) SS.

Subscribed and sworn to before me this 13th
day of May 19 76.

Whitney E. Trappis
~~Justice of the Peace and/or~~
Notary Public
Whitney E. Trappis
Notary Public
My Commission Expires March 19, 1980